Vanishing Acts: Notes on a Genealogy of Dematerialisation


Invited to a group exhibition in May 1969, the conceptual artist Robert Barry came with a rather improbable proposal. The work, which would become known as the *Telepathic Piece*, consisted of the following proposition:

During the exhibition I will try to communicate telepathically a work of art, the nature of which is a series of thoughts that are not applicable to language or image.

This work is not only extraordinary due to its alleged utilization of a paranormal mode of transmission – a procedure, for sure, which will have rattled some of his more analytically minded fellow conceptualists – but it also dissolves the material ‘work’ as such into a presumed act of disembodied, immediate contact between minds. Even though conceptual art, ever since the publication of Lucy Lippard and John Chandler’s essay ‘The Dematerialization of Art’, has been associated, for better or for worse, with the reduction – if not the complete vanishing – of the material support of the work of art, the *Telepathic Piece* certainly takes this imperative of dematerialisation to an absurd extreme.¹ Not even Barry’s own previous works, such as the *Carrier Wave Pieces* (1968), the *Inert Gas Series* (March 1969), or the *Radiation Piece* (March 1969), with their precise,

technical specifications\(^2\), cancelled out the existence of a material substrate, even if the actual substance of the work could not be sensed by the human body. If these ethereal works existed beyond the bandwidth, as it were, of the human sensorium, they were still conceived in terms of a sculptural occupation of physical space: the propagation of radio waves, the expansion of inert gas, or the particle emission of radioactive isotopes, respectively. As such, these works belong to the phenomenal realm of instrumental observation – an aesthetics of techno-science\(^3\) – yet the *Telepathic Piece* stepped outside the bounds of ‘normal scientific understanding’, entering into the realm of the paranormal.\(^4\)

What interests me in Barry’s example is not how this ‘paranormal’ work, which seeks out the contemporary boundaries of a legitimate practice of art, might be reinscribed within the horizon of one or the other conceptualist project.\(^5\) Rather, I would like to keep its excessiveness in play, considering how it operates on the limits of a ‘normal understanding’ of what is considered recognisable, verifiable, and comprehensible as a work of art or, for that matter, a factual event, which conforms to the criteria of scientific evidence. Obviously, the point is not to argue for or against the validity of a paranormal phenomenon such as telepathy, but rather to question what the paranormal reveals about a specific, historical configuration of discourses and techniques, the rules that govern a particular *dispositif* of knowledge and power, since the *para*-normal is literally that which functions ‘analogously or parallel to’ yet ‘separate from or going beyond’ a normative discourse. And, therefore, the real issue here is how Barry’s *Telepathic Piece* figures within a genealogy of discourses of ‘de-materialisation’, which includes not only art historical texts, but also disquisitions on media technology and communication.\(^6\) For the paranormal and, more spe-

\(^2\) The full titles read, for instance, *88 mc Carrier Waves*, 1968, 88 megacycles, 5 milliwatts, 9 volts, DC battery; *Inert Gas Series: Krypton*, from a measured volume to indefinite expansion. On March 3, 1969, in Beverly Hills California one liter of Krypton was returned to the Atmosphere; and *Radiation Piece*, Cesium 137, 0.51 MEV Beta-Energy, March 6, 1969, H.L. 30 Years.


\(^6\) This genealogy of dematerialisation remains to be written in full. It would, most likely, find its starting point in the German idealist aesthetics of the nineteenth century, where it would be connected to comparable terms, such as *Entsinnlichung* and *Entstofflichung*. The word *Entmaterialisierung* frequently appears in the writings of art historians of both the late nineteenth century and early twentieth century (e.g. August Schmarsow, Alois Riegl, and Max Raphael). It reappears, during the 1920s, in the writings of visual artists such as Oskar Schlemmer, El Lissitzky, and László Moholy-Nagy, but it is now connected to new media technology; a conceptual link that would continue into the later part of the twentieth century (e.g. Jean-François Lyotard’s exhibition *Les Inmattériaux*). Comparable concepts have been Arnold Toynbee’s notion of ‘etherealisation’, which was adopted by Lewis Mumford, and Buckminster Fuller’s ‘ephemeralization’. Dematerialisation is not only an aesthetic or technological term, but it is also used to describe the process of material economisation in the production of commodities.
cifically, the spiritualist tradition of the nineteenth century, was, as John Durham Peters has pointed out, ‘one of the chief sites at which the cultural and metaphysical implications of new forms of communication were worked out […] and it is also the source for much of our vocabulary today (medium, channel, and communication): In the spiritualist tradition, he observes, communication was a concept ‘that straddled the line between physical transmissions (the telegraph) and spiritual ones (messages from the other side)’ so that, he concludes, ‘the spiritualist imagery of media is still with us today.’

From invisible radio carrier waves to telepathic communication, Barry places himself, unwittingly for sure, within the same imaginative space of the nineteenth century, where the physical and the metaphysical could meet in surprising combinations. A well-known denizen of this ‘paranormal’ realm was Sir William Crookes, the inventor of the cathode-ray tube and a spirit photographer, who in an article from 1892, ‘Some Possibilities of Electricity’, not only conjectured that we can exchange ‘intelligence’ by means of wireless telegraphy, but that we might, one day, even be able to transmit our ‘brain waves’ directly, without a physical apparatus, from one mind to another. Indeed, the very notion of brain waves, as Peters dryly notes, was originally invented in the 1880s in an attempt to explain the process of telepathy and would only receive its present, electrophysiological meaning in the 1930s. As if consumed by the dream of a mediumless, bodiless mode of instant contact between minds, the nineteenth century gave birth to a theory of communication on the basis of a ‘physicalisation of idealism’. Indeed, the ideal of communication, whether considered from a technical or a spiritualist standpoint, may have been reduced to an immaterial communion of subjects, but, in practice, communication was bound up with all kinds of materialisations of the medium, whether in the shape of an individual person or that of a technical apparatus.

Telepathy, for instance, might have been modelled on the technical example of the telegraph, but the latter relied on the transmission of physical signals that have to be decoded into intelligible thought, allowing the possibility of a distortion or failure of the message. As a means of direct communication of thought, telepathy would not be susceptible to such an interference of noise. Which is why, presumably, Barry proposes to communicate a series of thoughts which ‘are not applicable to language or image’. To be truly immediate, communication cannot assume an encoded form, which, of course, a more contemporary, semiotic, or informational theory of communication would dismiss as being impossible in principle. We are left, therefore, to wonder what the content of such a series of conscious thoughts might be if they cannot be represented in either a verbal or visual form. And, furthermore, it becomes obvious that Barry’s telepathic act can never be verified: How are we to know that his thoughts have been implanted in another mind if the recipient cannot express this circumstance by means of words or images? The Telepathic Piece thus reproduces the paradox at the heart of the spiritualist tradition

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of communication, which, as Peters asserts, is equally at work within the technological imagination as well: communication can never completely rid itself of a material surplus, which then becomes not only a source of social anxiety regarding the possible distortion and falsification of messages as they circulate within a mass media system, but also a substratum upon which conflicts of power can take place. Even in the case of the *Telepathic Piece*, we cannot know for sure if it corresponds to a democratic ideal of communication, which would achieve ‘a state of shared understanding and instant sympathy between people’ without needing to rely on the grosser vehicles of word or speech⁸, or whether it represents a more insidious mode of mind control, whereby the sender would imprint his thoughts on the passive mind of the recipient. But more on this later.

I propose, for now, that we keep this nineteenth-century legacy in mind as we return to 1969 and consider the *Telepathic Piece* within its own historical context. This, in turn, will lead to a discussion of two other artistic projects, Zachary Formwalt’s film installation *In Light of the Arc* (2013) and the Otolith Group’s found- footage film *Anathema* (2011), extending our genealogy of dematerialisation into the present. In the first case, I will correlate the classical modus of commodity criticism, which decries the ‘real abstractions’ of capital as a distorting mode of communication between social actors.⁹ Money, in Marx’s view, was a baleful medium of mass communication, which, as Peters puts it, ‘turns dialogue into dissemination, just as the telephone, phonograph and radio would all later play havoc with received ideas of conversation’.¹⁰ The dematerialisation of conceptual art served some artists and critics as a political principle of negation, arguing that an ephemeral art would resist all commodification. Yet this principle proved to be more metaphorical than factual in nature, and, in the end, there was always a material remnant that could be put up for sale.¹¹ Rather than continuing this dialectic in which art opposes its own objectification, Formwalt’s work questions what happens when the money-form itself assumes a thorough-going state of dematerialisation in a financialised economy. Is it even possible to represent this etherealisation of current modes of capitalist reproduction? Whereas the medium of the LED screen, as both a carrier of translucent images and a tangible object in itself, functions as a central device in Formwalt’s film, in the second case, that of Otolith’s *Anathema*, the contemporary imagery that surrounds the technol-

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¹¹ At first, Barry was not sure how to present the *Inert Gas*, *Radioactive*, and *Carrier Waves* series. He took photographs of the sites where, for instance, the gas was released, but decided against showing the images. Nevertheless, these documents are now included in retrospectives. See *Some places to which we can come home. Robert Barry, Works 1963 to 1975*, Bielefeld, 2003.
ogy of liquid crystal screens is rendered uncanny, linking this medium back to the spiritu­alist tradition of the nineteenth century. As a matter of fact, the discovery of liquid crystals during the late nineteenth century led to conjectures that they provided the missing link between dead and living, inorganic and organic matter. Rather than the artist-medium connecting by means of telepathy to his audience, in Anathema we appear to witness the technical medium itself passing across the optical threshold of the flat-panel display, assuming a ‘teleplasmatic’ presence. And so, as the Otolith Group suggests, we must develop a counter-spell to resist these invading spectres of a ‘mediumistic’ technology.

But let us return, first, to the prior example of Barry’s Telepathic Piece. We have seen how it corresponds, at least in name, to a nineteenth-century theory of communication as disembodied, immediate contact. Genuine communication, that is to say, can only take place without the interference of a material substrate, whether one is speaking of a spiritu­alist or a technical medium. All other kinds of human commerce must rely on physical signals that are prone to delays, confusion, or even worse. In the context of modern art, this medial question – what is genuine communication? – becomes one of intentionality: how sincere is Barry in proposing this work? As a matter of fact, he has often been asked to respond to this concern, and in answering the question as to whether he believes in telepathy, his answers have run the gamut from being affirmative to being negative or even ambivalent in kind.12 The piece, as the artist states, ‘only exists in the form of a catalogue page’. Yet he also claims to have tried to execute the work without being able to vouch for his success. This, in itself, is a tried-and-true procedure of those artists out to ruin the litmus test of modernism, according to which the seriousness of the work must not stand in doubt. Indeed, a formalist critic like Clement Greenberg did not respond well to irony. Yet I am not concerned here to demonstrate that the Telepathic Piece realises an ironic showdown with regard to the modernist construct of authorship.13 Nor, for that matter, am I concerned with the extent to which the Telepathic Piece can be situated within the horizon of one specific conceptualist project or the other. That is to say, I am less interested with how the Telepathic Piece fits within a distinct model of conceptual art than with how it is located, somewhat uncomfortably, on the edge of the discursive system of conceptualism as a whole. It is this ‘paranormality’, as it were, of the work, which indicates, if not purposefully expresses, what remains unthought within the media aesthetics of the 1960s. It is not surprising, therefore, that the Telepathic Piece would be followed by Barry’s so-called Psychic series, where the artist invokes the existence of phenomena

12 In conversation with Benjamin Buchloh, Barry declared: ‘If it existed, then it existed. I don’t know if I believe or don’t believe. I really don’t know.’ He allows that the work had an ironic element, but he also insists that he actually ‘practiced’ the work, and, elsewhere, he has described how he extensively researched the phenomenon of telepathy at the time. Buchloh, ‘A Conversation with Robert Barry’, p. 133.

13 Barry was not the only artist to introduce a ‘mediumistic’ theme into his work during the 1960s. Another example is Sigmar Polke’s painting Höhere Wesen befahlen: rechte obere Ecke schwarz malen! (1969).
which are not consciously sensed or thought, without, however, proposing what this aesthetic unconscious of conceptualism might consist of.

To put it differently, what I am proposing is that Barry’s *Telepathic Piece* is not only an exemplary case of the dematerialisation of conceptual art; it is exemplary to an excessive degree. It is worthwhile, at this point, to rehearse some of the main aspects of Lippard and Chandler’s thesis, although I shall forego the gratuitous exercise of analysing its obvious shortcomings in depth.

According to Lippard and Chandler, contemporary art was entering a ‘post-aesthetic stage’ of development in which ‘ultra-conceptual art’, which privileged the ‘thinking process almost exclusively’, was set to make the art object wholly obsolete.14 Indeed, ‘art as idea’, Lippard states, is able to achieve a state of absolute autonomy which is no longer checked by the ‘present limitations – both economic and technical’ – from which modernist art still suffered. Contrary to such a teleological view of art history, which betrays the lingering influence of modernist aesthetics on the essay’s young authors, a genealogy of dematerialisation such as I write of here focuses on a constant working through of the shifting technical, economic, and institutional limitations of artistic practice, not their transcendence.

It is noteworthy, in the light of the previous discussion, that Lippard and Chandler connected the process of dematerialisation to the introduction of new technological media within the field of contemporary art. At this point, the text comes close to articulating a communicative theory of art, which harkens back to the spiritualist tradition of the nineteenth century.15 Not only do the authors claim that ‘ultra-conceptual art’ is capable of transmitting ‘pure thought’, but they also claim that it commutes ‘pure energy’. That is to say, dematerialisation not only refers to the transmutation of art into a pure idea, but also into a ‘pure action’ or what today we might designate as a performative event. With ‘the introduction of electronics, light, sound, and, more important, performance attitudes in painting and sculpture’, Lippard and Chandler write, the self-enclosed objects of painting and sculpture were broken up, opening onto a temporal field of experience organised by serial structures of movement. Therefore, Lippard and Chandler seem keen to advertise film as one of the most advantageous media to further their programme of dematerialisation. Reading their essay in hindsight, it is startling that one of the first examples they provide is not one of the text-based works which determine the later canon of conceptual art, but Michael Snow’s film *Wavelength*. This comes all the more as a surprise when we consider that the following year, P. Adams Sitney, in his famous ‘Structural Film’ essay, would champion Snow’s film within a distinctly modernist framework of medium-specificity that

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15 Even so, Lippard and Chandler avoid reducing conceptual art to a mere communicative act. They observe, for instance, how the audience of a John Cage or Yvonne Rainer performance ‘will never know what the conceptual framework of the work is’.
the ‘post-aesthetic’ theory of Lippard and Chandler aimed to overcome. Nevertheless, in singling out the medium of film as an agent of dematerialisation (rather than a medium to be explored for its own intrinsic, material properties), Lippard and Chandler continued the tradition of the historical avant-garde which had already connected the ‘new media’ of photography, film, and radio in a favourable sense with a progressive Entmaterialisierung of art. The difference with the films of Formwalt and the Otolith group, as we will see, is that the medium is not treated as an agent of dematerialisation as such, but as a technological apparatus that is implicated within a complex dialectic of visibility and tactility, of dematerialisation and materialisation, which is based on specific socio-economic conditions. Dematerialisation, in this sense, is not defined in terms of an ontological category (i.e. a supersensual idea), identified as an intrinsic tendency of technology, nor is it even dismissed as a mere metaphor. Rather, dematerialisation is considered as part of a historical system of values in which it acquires a different ideological significance at different moments in time. Dematerialisation is not ‘good’ or ‘bad’ in itself, just as we would be mistaken to conceive of it as the mere opposite of materiality. In fact, dematerialisation is always caught up with some form of (re-)materialisation.

However, this is not necessarily how Lippard and Chandler viewed the issue. For them, dematerialisation denoted a mode of abstraction – a one-way street – in which art increasingly approached the immaterial state akin to that of ‘mathematical logic’. One of their sources is Joseph Schillinger, whom they describe as ‘a minor American Cubist’, but who was in fact a music theorist of some fame during the 1920s and ’30s. Schillinger was the author of a hefty tome called The Mathematical Basis of the Arts (1943), which is largely forgotten today, but it is on the basis of this ‘extraordinary book’ that Lippard and Chandler envisioned the impending ‘disintegration of art’ in the liberation of the idea. Schillinger did not shy away from making wild predictions about the future in The Mathematical Basis of the Arts. He foresaw that at the ‘logical end’ of a ‘continuous process of abstraction’, the human mind would be reduced to an electrical circuit in the same fashion that music would be formalised by mathematical patterns: ‘As physiology becomes a branch of electrical engineering in the study of brain functioning, esthetics becomes a branch of mathematics’. Schillinger was not alone, of course, in making such crass analogies between the practice of art and that of mathematics. The same analogy was employed in the context of concrete art although, perhaps, in a slightly more hesitant

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17 To their credit, Lippard and Chandler temper some of the more extravagant claims of their article by observing that conceptual art may be ‘serious’, but that this fact does not rule out the existence of a humorous or witty dimension. Like the Dadaists and Surrealists before them, conceptual artists are said to be sensitive to phenomena of an ‘incongruous’ nature. Thus, Sol LeWitt’s serial projects are described as a kind of ‘blind man’s art’ which contain ‘a few visual aspects that make no “sense” to the viewer’, despite the geometric simplicity of their structure.
Throughout the modern period, mathematics acted as a cipher of abstraction within cultural discourse and not only in a positive fashion. One only has to think of Georges Bataille’s mockery of the ‘mathematical frock-coat’ of philosophy or Georg Lukács’ critique of reification as based in the ‘mathematical analysis of the work-process’. Indeed, the dematerialisation of social relations, which is caused by the formal abstractions of capitalist exchange, has its counterpart in the objectification [Verdinglichung] of the worker and his products, which ‘acquire a new objectivity, a new substantiality which they did not possess in an age of episodic exchange and which destroys their original and authentic substantiality’. The mathematisation of the world by instrumental reason, in other words, has not only created a spurious form of objectivity, but it has also disabled the possibility of immediate, ‘authentic’ communication between individuals. Dematerialisation, therefore, is as much associated with an ideal of immediate communication as it is with an anti-type of communicative disorder – which comes as no surprise, as it was Karl Marx, in the midst of the spiritualist craze of the nineteenth century, who hoped to exorcise the spectres of capitalism.

But before we turn to a more recent version of this old ghost story, I wish to say a few more words on this discursive constellation constituted by the terms dematerialisation, abstraction, and mathematics. As I suggested before, we can interpret the paranormality of Barry’s Telepathic Piece in another sense: namely, as operating on the boundaries of the ‘normative’ system of artistic discourse. As a concept, the paranormal may seem excessive, lying as it does outside the realm of the ordinary, but it acquires its meaning within an existing system of knowledge. We may not know if Barry is able to transmit his thoughts, but we know what he meant to do, just as the spiritualist tradition of the nineteenth century could make sense of mentally transmitting thoughts insofar as it was rooted in a techno-scientific discourse (and vice versa). Moreover, the Telepathic Piece can be recognised as a conceptual work of art insofar as it conforms to the criterion of dematerialisation, which, again, it does, if to an absurd extent. And this would make some of Barry’s colleagues nervous, as the Telepathic Piece revealed what we may call the ‘spiritualist’ unconscious of a conceptualist theory of communication. The vanishing act of ‘art as idea’ can only be accomplished by an ethereal communion of minds: a scenario that spiritualism shares with certain contemporary, cybernetic phantasies. To name but one such example, Elon Musk, the Silicon Valley magnate, recently founded a company called Neuralink, the goal of which is to develop an ultra-high bandwidth interface between humans and computers. By means of a cranial implant, Musk hopes it will become possible


to download and upload thoughts, thus accelerating the ‘output’ of the human brain. Typing, apparently, is no longer fast enough. According to Musk, neurotechnology will enable us to remain the masters of Artificial Intelligence, but it is equally probable that we will have to make room for a corporate soul housed in our minds. Facebook has announced that it is investing in a similar technology that does not even require an implant, making it possible to ‘type directly with your brain’ and ‘hear with your skin’:

Over the next 2 years, we will be building systems that demonstrate the capability to type at 100 wpm by decoding neural activity devoted to speech. Just as you take many photos and decide to share some of them, so too, you have many thoughts and decide to share some of them in the form of the spoken word. It is these words, words that you have already decided to send to the speech center of your brain, that we seek to turn into text. […] We also described a system that may one day allow you to hear through your skin. You have 2 square meters of skin on your body, packed with sensors, and wired to your brain. […] Today we demonstrated an artificial co‑chlea of sorts and the beginnings of a new a [sic] ‘haptic vocabulary’.  

If Facebook’s ‘electrical engineering of the brain’ (Schillinger) were to become reality, it would not only be possible to communicate directly between minds, but as thoughts are transmitted by means of the epidermis, they would require no translation between languages. Barry’s _Telepathic Piece_ would not only become the new normal, but we will have arrived at a completely new stage of dematerialisation in which the body is not simply considered an impediment that stands in the way of perfect communication, but as the very physiological surface through which ‘a series of thoughts that are not applicable to language or image’ are exchanged. The material signals of words and images may dissolve into electrical impulses, but there is still the ‘infra‑thin’ density of the skin through which they must pass.

Dematerialisation is an asymptotic process: it always comes up against an irreducible limit, which holds the potential to transform all values within a given system of knowledge and practice. What was once a token of the immaterial or abstract (e.g. mathematics) returns in a new, material form. As a matter of fact, the notion of concrete art already suggested as much: the abstract is not ‘spiritual’ but fully objective. Likewise, Lippard and Chandler end their essay by observing that ‘Malevich’s _White on White_ seemed to have defined nought for once and for all’. Yet behind the spiritual ‘desert’ of Malevich’s white  

21 Facebook post (19 April 2017) by Regina Dugan, former head of the ominously named research group Building 8 at Facebook. Before joining Facebook, Dugan served as the director of the Defense Advanced Research Projects Agency.

22 Clearly, neurotechnology cannot deliver the promise of creating an Adamic language: one still needs to decode ‘thoughts’ into neurological or physiological patterns.
canvas stands, as we know, the ready-made of the blank canvas: the concreteness of social modes of production do not let themselves be spirited away that easily. And so, Lippard and Chandler acknowledge that the ultimate zero point has still not ‘been arrived at with black paintings, white paintings, light beams, transparent film, silent concerts, invisible sculpture’.

Even Joseph Kosuth – who had little patience with Barry, whose ‘work seems to exist conceptually only because the material is invisible’ – had to rely on physical ‘models’ in order to exhibit his analytic propositions to a spectator. Kosuth described these models as a ‘visual approximation of a particular object I have in mind’ (emphasis added). Although unavoidable, the model does violence to that which it models. In assuming this viewpoint, Kosuth actually internalised a dominant position within modern mathematics, namely that of the formalist who frowns upon the use of visual devices, such as diagrams, for the purpose of demonstration. In truth, the iconoclasm of formalist math surpasses that of Kosuth. The formalist mathematician, for instance, tends to distrust the ability of our mental faculty of spatial intuition to provide proper insight into geometrical problems; rather, mathematics should be grounded upon logical reasoning. Accordingly, Kosuth’s programmatic text, ‘Art after Philosophy’, approvingly quotes from the writings of the logical positivist A. J. Ayer:

> We see now that the axioms of a geometry are simply definitions, and that the theorems of a geometry are simply the logical consequences of these definitions. A geometry is not in itself about physical space; in itself it cannot be said to be ‘about’ anything.

Ayer’s statement that ‘a geometry is not in itself about physical space’ is the historical product of a post-Euclidean era in mathematics. Kant, for instance, could not conceive of the possibility that the Euclidean space that we intuit a priori is not the only possible form of empirical space. But to state that geometry is not “about” anything disrupts the representational system of Western art, which was based on a profound alliance between mathematics (i.e. perspectival geometry) and painting. Kosuth, by the way, is claiming something far more specific than the general fashion in which the mathematical field as a whole, without giving due attention to its internal differentiations, is lumped together

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25 ‘All I make are models. The actual works of art are ideas. Rather than ”ideals” the models are a visual approximation of a particular art object I have in mind’, J. Kosuth, ‘Notes on Conceptual Art and Models’ [1967], in *Art after Philosophy and After*, p. 3.
as a paradigm of abstract thought. Although we may not agree with Kosuth’s marshaling of formalist mathematics to his conceptualist cause, his approach has the advantage of pointing towards the fact that mathematics has its own history and does not inhabit a transcendent realm of timeless concepts.

Today, for sure, we cannot escape the fact that mathematics is not strictly a universal realm of pure thought constituted by the logical manipulation of abstract symbols; rather, its algorithms have assumed a force of social and economic organisation. Whereas Ayers allows that ‘we can use a geometry to reason about physical space’ without threatening his basic thesis concerning the autonomy of math, we need to take a step beyond such a relativist perspective.\(^{27}\) As a real abstraction, to use a Marxist term, mathematics has a concrete effect within society; it is bound up with historically specific regimes of governmentality. Indeed, the formalist ban on intuition in modern math was already being replaced in the 1960s by a resurgence of visual models in mathematics due to computer graphics. It is often said that we live in an algorithmic culture – a world shaped by computer operations – but it would be more correct to state that we live in a world of algorithmic governmentality.\(^{28}\) Mathematics is not just used to ‘reason’ about space, but it is an active force in the shaping of social reality. The immaterial gold of bitcoins, for instance, is but the latest extrusion of the algorithmic into the real, which, as some hope while others fear, could have a revolutionary impact on the stability of our current system of economic governance.

And so, the problem needs to be posed anew: The question is not how, in the context of the late 1960s, dematerialisation could resist the objectifying forces of the art market, but how, in our current, financialised age of ‘fictitious’ capital, it is possible to render the dematerialising forces of capital concrete. This, indeed, is a quite familiar question, which has been posed at several moments during the previous century: How can one create an image of capitalism if all it touches melts into thin air? It is easy to picture the products of capitalism, or even its sites of production, but how are we to imagine its underlying modes of exploitation and suffering? In the 1930s, Walter Benjamin suggested that a solution could be found in excavating an ‘optical unconscious’ of modernity, creating an analytic of time with the serial mechanisms of film. But how is one to visualise a financial economy that moves near the speed of light, its computer-driven activities of high-frequency and flash trading transpiring beyond the threshold of ordinary human awareness? Even the server farms, which are required to process all the immaterial data of the financial markets, are off-limits to most prying eyes. And should one manage to gain access, nevertheless, there is less to be seen there than on the work floor of the Krupp factory, which, as Berthold Brecht famously remarked, revealed nothing about reality.


Zachary Formwalt’s *In Light of the Arc* is the third film in a series about three stock exchanges (Shenzhen, Amsterdam, London). It consists of a two-screen installation that, at the outset, juxtaposes a shot of the workers in the interior of the Shenzhen stock exchange with an image, projected on the opposite wall, of a joint being welded by means of an electric arc. This seemingly arbitrary detail will, in a voice-over by Formwalt, open onto a fascinating meditation on the relations between light and darkness and between visibility and invisibility as they are distributed within the capitalist systems of industrial and spectacular production. Beyond its existence as a common tool – Formwalt could have chosen to focus on another element on the vast construction site – the electric arc begins to shed light on a different level of historical existence. It becomes emblematic of a capitalist organisation of society that we must think of, above all, as a kind of media system which seeks to control what will appear and what will remain in the shadows. The electric arc produces a dazzling brightness that also has a blinding effect: in order to see the seam, the welder must wear a mask, making everything but the immediate task invisible. On the construction site, the brilliance of arc welding is a pure excess, a waste of energy, but elsewhere this searing light becomes productive. Arc lights not only provided artificial illumination in nineteenth-century factories, speeding up the process of capital accumulation, but they also, in the shape of klieg lights, lit up the first movie sets. In fact, klieg lights were not only intensely luminous, but they also emitted harmful UV rays, meaning that the anonymous workers of early cinema had to wear sun glasses – a historical index of early industrial labour would thus later become transformed into the empty symbol of the Hollywood star system.

The arc light is an allegory of (in)visibility, which provides Formwalt with an entry into the general theme of the *Three Exchanges*, namely the opposition between the brightly lit surface of a so-called ‘efficient’ and ‘rational’ marketplace and the material sphere of production that it casts into a sheer impenetrable darkness. One story that is presented by *In Light of the Arc* is how the radiant, unfocused brilliance of the arc light becomes, as it were, concentrated and directed into the fibre-optic network of electronic trading. The film methodically approaches the very threshold or outer limit of what can be represented. What lies in the shadows is not just some kind of material substructure that is concealed below the surface of the market exchange, but a kind of latency, a constant background of noise, which the media system of financial capitalism seeks to suppress but can never completely control.

The space of financial power resists easy access; it will not give up its secrets easily. Not only is there no material product to show, but there is also very little physical

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29 This part draws upon my previous essay, ‘Three Exchanges,’ in *Zachary Formwalt*, Amsterdam, 2015, pp.54–79.
activity to follow. Particularly since electronic trading began to replace the trading floor in the later 1980s, the boisterous, face-to-face activity of open outcry trading has been silenced and replaced by the humming of computer data centres. Algorithms, not human interaction, are what drive the high volume, high-speed nature of contemporary financial markets. There is, literally, almost nothing to see, and that which remains visible has become inaccessible. The heart of the contemporary stock exchange consists of row upon row of black boxes, connected by miles of data cables, pulsing with infra-red signals. What is there left to illustrate, Formwalt notes, if the actual trading occurs beyond the threshold of human perception? What In Light of the Arc dramatises, precisely, is this inability to obtain a complete overview of the capitalist system, to situate ourselves within its dynamic flows of tangible and intangible commodities.

In the Shenzhen Stock Exchange, the visual language of allegory appears to come up against the final limits of abstraction. Formwalt quotes from the website of OMA, the architectural firm that designed the structure in 2006: ‘It is a building that has to represent the stock market, more than physically accommodate it.’ Due to electronic trading, the Shenzhen exchange has no need for a trading arena. All that remains is a purely ceremonial space where the entry of a new company onto the market might be celebrated in front of an assembly of the financial press (Fig. 1). A bronze bell hangs in this hall that can be rung to start the trading day (Fig. 2). ‘Perhaps the bell ceremony,’ Formwalt suggests,

‘has taken the place of Mercury or some other god of commerce’. This hall is located in the most peculiar feature of this building: a floating base. OMA, it appears, wants to transform the whole building into an allegory of financial abstraction:

As if it is lifted by the same speculative euphoria that drives the market, the former base has crept up the tower to become a raised podium. Lifting the base in the air vastly increases its exposure; in its elevated position, it can ‘broadcast’ the activities of the stock market to the entire city.31

For all its declamatory style, however, this is architecture that wants to make itself invisible. The ‘robust exoskeletal grid’ of the tower, we read in the same text, is ‘overlaid [sic] with a patterned glass skin. […] The patterned glass reveals the detail and complexity of construction while creating a mysterious crystalline effect as the tower responds to light’. A clearly articulated grid reflects its surroundings, but in doing so, Formwalt’s voice-over observes, it renders its surroundings mysterious: ‘a strange lighting effect replaces the structure’. And so, we are asked to consider how this architecture is located in the gap between two boxes: one formed by the exoskeletal grid and one by the black box of the computer; one that we are permitted to see and one that we are not. And, ultimately, the voice-over declares, this gap is nothing less than the fissure between ‘the world we inhabit and the prices that project it’.

One type of noise, as Three Exchanges has shown, did vanish: the sound of the open outcry, the shouting on the trading floor, which was necessary to transmit a signal – the correct price – amidst the confusion. Yet disappearances, as In Light of the Arc maintains, are often just a form of displacement. Quite in contrast to the myth of an efficient market, which is based on the notion of total information, electronic trading has developed new strategies of concealment. Large trades, for instance, will be broken down, fractally, so that ‘no other trader shall see the whole’, which appears as ‘a thousand tiny reflexes rather than a single coordinated movement’. The problem then becomes how to distinguish signal from noise. The media system begins to run into its own limitations: the greater the resolution of the image, the more distraction or disinformation occurs. Thus, the camera in In Light of the Arc zooms ever further into a LED screen on display in the ceremonial hall of the Shenzhen stock exchange, until the very texture of the screen itself becomes visible. This texture, Formwalt notes, is but noise, but it is also what holds the image together. De-materialisation, in other words, once again comes up against its own limits.

31 Ibidem.
The Otolith Group’s *Anathema* appears to make a statement similar to that of *In Light of the Arc* about the invisibility of the capitalist means of production. Compiled from numerous commercials for new touch screen and liquid display technologies, *Anathema* repeatedly zooms into the surface of the interface, not only magnifying out the separate, glowing pixels of which the digitised image is constructed, but also allowing the image itself to lose its resolution, assuming the geometric, abstract appearance of crystalline growth. However, this magnification and slowing down of the image do not reveal any solid base from which all illusions are crafted. The point of view in *Anathema* seems to alternate between the user and the machine itself. It as if these advertising films, through the manipulation of the Otolith Group, show the gestation of a phantasmatic body, an embodied, artificial intelligence, which not only returns the look but also mimics the gestures of the user. There is an almost imperceptible bulging of the touch screen surface, a synaptic burst of energy within an electric field (Fig. 3). The finger touching becomes the finger touched in a phenomenological short-circuit between body and screen.

*Anathema* restages the dichotomy of the visible versus the invisible in terms of a sensorial dualism between the haptic and the optical, between touch and vision, a set of binary terms which, originally, informed the art historical discourse of the later nineteenth century and, in particular, the writings of Alois Riegl. The tactile operates both as a concept within visual psychology and as a category of aesthetic judgement, which is to say that it is situated within a hierarchy of sensual experience that has undergone various
historical inflections. Within Riegl's aesthetic system, for instance, opticality is ranked higher than tactility. And, as we have seen, a formalist regime of modernist art adopted a similar position. It is striking, therefore, that in Walter Benjamin's essay *The Work of Art* this hierarchical relationship between the optical and the haptic is reversed. Benjamin, as is well known, associated the tactile with various features of experience under modernity, such as the spectator's state of distraction within the cinema, the technological proximity of images (and thus the destruction of their aura) as well as the corporeal exploration of urban space. The tactile, in short, was favoured as a means of bodily innervation, as a means to habituate the modern subject to the alien space of industrial production. And this privileging of the tactile, if for different reasons, is continued by Marshall McLuhan and Jean Baudrillard. The latter, for instance, would constantly stress the tactile aspects of a 'hypervisual' regime of informatisation, which institutes closed feedback loops between a human and a machine:

The interface relation between interlocutors, or the interface relation to knowledge in information processing, is the same: tactile and exploratory […]. The whole paradigm of sensibility has changed. The tactility (see McLuhan) is not the organic sense of touch, it merely signifies the epidemic contiguity of eye and image and then the vanishing of any aesthetic distance. We are coming closer and closer to the image, our eyes as if disseminated in the surface of the screen.32

For the sake of brevity, I shall leave aside how this discussion of 'epidemic contiguity' between the skin of the body and the skin of film has been taken up in film studies, this being a discussion which often deals with the tactile on a more metaphorical than literal level. What interests me here is how *Anathema* locates its imagery between the tactile and the optical, that is, precisely in that paradoxical zone of Karl Marx's 'sensuous nonsensuous object' [*ein sinnlich übersinnliches Ding*], which is the phantasmagorical domain of the commodity fetish.

The fetish, here, however, is not so much an object as it is a technology, which seems to 'possess' the souls of its users. And in this sense the title, *Anathema*, must be comprehended in its most literal meaning, namely as a kind of 'excommunication'. The compilation film not only represents the literal conjunction between the tactile and the visual, which is promoted by touch screen technology, but it also implies that the haptic is not, contrary to avant-gardist belief, a medium of enlightenment, if you forgive my use of a mixed metaphor. Recall, for instance, how Benjamin illustrated the division between touch and vision by drawing a comparison between the healing activities of a sorcerer and that of a surgeon. The former may lay his hand on the patient, but he always main-

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tains a ‘natural distance between himself and the person treated’ by means of his authority (and, therefore, the painter is nothing but the alter ego of the magician.) The surgeon, on the other hand, is said to penetrate deeply into the tissue of reality, which makes him a companion of the avant-garde filmmaker in his revelation of the optical unconscious of modern visuality.

*Anathema*, despite all its ‘penetrating’ and ‘probing’ imagery – the magnification of the screen, the interpenetration of screen and reality – does not establish the position of a knowing subject who demystifies the apparatus by laying its entrails bare. Rather, one enters a liquid, instable world without fixed contours. As Kodwo Eshun has commented,

> if you zoom into the skin of all those smiling faces what you get is this animated geometrical landscape [...] and you end up in a world where you don’t have any coordinates, slowly but surely you learn to enjoy the drift that happens inside of technology.³³

*Anathema* shares its imagery with a post-Bauhaus visual culture which is fascinated by reproductions of metastable, crystalline structures that are suspended between liquid and solid, organic and inorganic, animate and inanimate states of death. In *Anathema*, the optical unconscious of Benjamin is translated back into Freudian terms; it envisions the conscious self as gripped by a more primitive, animistic relationship to a seemingly enchanted world. The appropriation or *détournement* of advertising material in *Anathema* visualises an uncanny, social unconscious of communicative capitalism, a turbulent zone, where the ‘soberness’ of ideology critique can gain no foothold. Against such intoxicating dreams – ‘one learns to enjoy the drift’, as Eshun notes³⁴ – contemporary subjects cannot protect themselves. It is not that our vision is compromised, that we are blinded and cannot see actual ‘social relations’ for what they are, but that the apparatus of communicative capitalism captures its users. (The film ends on a counter-spell, a poem written by Fred Moten.)

The notion of communicative capitalism derives, of course, from Jodi Dean, who argues that the informational infrastructure of social networking sites presents a series of fantasies: an ideological triad of abundance, participation, and wholeness. The Internet, in short, rather than furthering the avant-garde project of emancipation and democratisation, converts the public space of politics into a realm of communication for the mere sake of communication, where users live under the illusion that their interactions assort an effect in the real world.


³⁴ *Ibidem.*
While this might sound like an old case of false ideology at work, the Otolith group, as I have insisted, does not propose that we descend to that infernal 'secret abode' of production in order to see if there is anything left to be discovered. In this respect, Otolith's strategy is different from that of Formwalt's even though the latter also avoids the trap of ideology critique: what lies beneath the surface of communication is not a fixed ground – the concrete made visible – but a formless, fuzzy realm of noise and static in which algorithms seek to hide their own footprint at the risk of their own entropic dissolve. One might say that it is in the nature of the 'concrete' – that sunken world where Marx expected to encounter real social relations – to be invisible. Anathema, on the other hand, explores the contradictory space between what is visible (and tactile) and what is 'abstract' – 'the dream that communicative capitalism has of itself'.

The film conjures an enchanted domain where inanimate crystals seem to assume an animate state. A kind of black magic or necromancy appears to be at work here, or what Isabelle Stengers and Philippe Pignarre have called a form of 'capitalist sorcery'. Their rather idiosyncratic phrase is meant to resonate with the language of the Communist Manifesto (if not with the chapter in Capital on commodity fetishism), where it is said that the bourgeoisie is 'the sorcerer, who is no longer able to control the powers of the nether world whom he has called up by his spells'. This rhetoric of bewitchment, which Stengers and Pignarre adopt, is meant to draw out the idea that the old notion of ideology is insufficient to explain how capitalist power asserts itself in the present. 'Ideology', they write, 'connects with the image of a screen, of ideas that screen out, that block access to the “right point of view”'. The notion of ideology assumes that certain faults in our perceptual apparatus, our blind spots, can be corrected by a critical process of demystification. But Stengers and Pignarre refute the viability of ideology critique. The 'minions' of capitalism, they assert, are not blinded by ideology. Rather, to be bewitched or captured by communicative capitalism 'implies that it is the capacity to see itself that has been affected'. As a result, we seem condemned to a choice between the 'infernal alternatives' that the system offers us. To invent a counter-spell, it does not help, Stengers and Pignarre argue, to seek the concrete behind the abstractions of capitalism by asking, for instance, 'What would the fair value of labor power be?'. As it is the nature of capitalism to constantly reconstruct its social relations, it is but a vain hope, to expect to find a permanent framework of orientation. So much may be true, but if In Light of the Arc might be called an allegorical reading of capitalism, are we not in danger here of entering a more metaphorical comprehension of the current technological state of capitalism?

What the constantly mutating, liquid crystal world of dissolving fingertips and rippling

38 Pignarre and Stengers, Capitalist Sorcery, p. 43.
screens in *Anathema* reveals is a turbulent zone of pleasure and anxiety, in short the affective dreamscape of communicative capitalism. But we also remain in need of representations of the more concrete effects of capitalist abstractions. Today the algorithms that run our computers are nothing but ‘concrete abstractions’, as Marx said of money. And if Elon Musk’s *Neuralink* may one day realise a telepathic society in which every firing of our neural network becomes subject to outward valorisation, the old dialectics of de-materialisation will not have become obsolete; they will simply have entered a new stage of development.